

SammieStage1

Stage 1 Identify Desired Results

Establish Goals: (G)

Common Core State Standards

Content Area: Mathematics

Grade Level: High School

Domain: Functions

Standard: Construct and compare linear, quadratic, and exponential models and solve problems.

Cluster:

- F-LE.1.Distinguish between situations that can be modeled with linear functions and with exponential functions.
 - Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.
 - Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.
 - Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.
- F-LE.2. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
- F-LE.3. Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.
- F-LE.5. Interpret the parameters in a linear or exponential function in terms of a context.

What understandings are desired?

Students will understand that: (U)

- Choosing the appropriate mathematical model for a given situation requires examining the data from more than one perspective.
- principal, interest and time are factors that impact financial outcomes in unique, yet critical ways.

- exponential functions grow by equal factors over equal intervals, not by equal differences over equal intervals.

What essential questions will be considered?

Essential Questions: (Q)

- Why is it important to view data from more than one perspective when modeling a given situation?
- Why is it important to consider the exponential relationship that exists between principal, interest and time when making financial decisions?
- How do the rates of change of linear functions compare to the rates of change of exponential functions?

What key knowledge and skills will students acquire as a result of this unit?

<i>Students will know: (K)</i>	<i>Students will be able to: (S)</i>
<p>•vocabulary: data, exponential growth/decay, principal, interest, ammortization, regression coefficient</p> <p>•critical Ideas: principal, interest and time are the three factors that influence pay off amounts for loans. data requires critical evaluation in order to model appropriately with a mathematical representation.</p> <p>•formulas: $A = Pe^{rt}$, $y = mx+b$</p>	<p>•(1) model exponential functions for given parameters and use their models to predict outcomes.</p> <p>•(3) evaluate the rates of change of linear and exponential functions.</p> <p>•(3) test the regression coefficient of linear and exponential functions.</p> <p>•(1) analyze data to determine what type of function would best fit the data.</p> <p>•(2) assume the role of a perspective college student with given financial resources and career plans.</p> <p>•(2) reflect on the cost-to-benefit ratio of post-secondary decisions.</p>

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